

REMARKS

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-13 were pending. By the present response, claims 9, 11 and 12 have been amended, claims 1-5 canceled, and claim 14 has been added. Thus, upon entry of the present response, claims 6-14 are pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims.

ELECTION/RESTRICTION

Applicants note that the restriction requirement has been made final. By the response, applicants cancel claims 1-5, without prejudice to applicants' rights to reintroduce these claims, petition the restriction requirement, and/or file one or more divisional applications directed to the nonelected claims.

CLAIM OBJECTIONS

Claims 9-13 stand objected to on the grounds set forth on page 2 of the official action. In particular, the claims are objected to under 37 CFR 1.75 (c) as been in improper dependent form. This objection is respectfully traversed.

Applicants filed a Preliminary Amendment on March 15, 2004 which canceled all multiple dependencies in these claims. The above-reference amendment is

contained in the Patent Office Image File Wrapper system. Reconsideration and withdrawal of the objection is respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §112

Claim 9 stands rejected under 35 U.S.C. §112, first paragraph, on the grounds set forth on page 3 of the Official Action. By the present response, claim 9 has been amended in a manner which is believed to address the above-noted rejection, while not narrowing the scope thereof. Thus, reconsideration and withdrawal of the rejection is respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 6-13 stand rejected under 35 U.S.C. §103 (a) as being obvious over U.S. Patent Number 5,453,329 to Everett et al. (hereafter "Everett et al.") in view of U.S. Patent Number 5,223,332 to Quets et al. (hereafter "Quets et al.") on the grounds set forth on pages 4-6 of the official action. This rejection is respectfully traversed.

The present invention is directed to a seal system. Conventional seal systems of cobalt-chromium carbide have a deficiency in that they form too much cobalt oxide, and thus do not provide the desired service lifetime when operated in an environment including high temperatures (see, e.g. page 1, lines 25-30).

A seal system constructed according to the principles of the present invention is set forth in claim 6. Claim 6 recites:

6. *A seal system between two articles wherein at least one article is coated with a wear protective coating, the coating comprises at least a first layer on the surface of the article, the first layer comprising a certain amount of chromium carbides dispersed in a cobalt matrix and at least a second layer of the coating on top of the first layer, the second layer comprising an amount of chromium carbides dispersed in a cobalt matrix which is higher than the amount of chromium carbides in the first layer.*

Neither Everett et al. nor Quets et al., taken alone or in combination, disclose or even suggest the seal system recited in claim 6 above.

Everett et al. is directed to a method for laser cladding thermally insulated abrasive particles to a substrate, and a clad substrate thus formed. In particular, Everett et al. teaches a method which includes applying a high energy source to the substrate thereby creating a small pool of superheated molten metal at the surface. A mixture of powdered metals is then introduced into the superheated molten metal. The powders comprise a mixture of matrix metal powder and coated abrasive powders. The abrasive powders may be formed from chromium carbide.

Everett et al. is deficient in several respects. First, Everett et al. discloses the formation of a single layer on a substrate and not a first and second layer as required by claim 6. In addition, Everett et al. fails to disclose how much chromium carbide may be contained in the sole layer formed on the substrate.

Quets et al. discloses a duplex coating for substrates that comprises an undercoat of tungsten carbide-cobalt and a top coat of a ceramic material such as alumina. Quets et al. purportedly discloses the addition of chromium to the undercoat:

The tungsten carbide-cobalt coating material for the invention could include a small amount of chromium, preferably from about 3 to about 6 weight percent and most preferably about 4 weight percent. The addition of chromium is to improve the corrosion characteristics of the coating. (Column 4, lines 21-26) (emphasis added)

However, Quets et al. clearly fails to disclose the addition of chromium carbide to the undercoat. None of the layers described by Quets et al. contain chromium carbide.

Thus, even if the teachings of Everett et al. and Quets et al. were combined in the manner suggested, the claimed invention would not result. Namely, neither Everett et al. nor Quets et al., taken alone or in combination, suggest the formation of the seal system comprising at least two coating layers, each comprising chromium carbide.

In addition, claim 6 requires that the amount of chromium carbide contained in the second layer of the seal system be higher than the amount of chromium carbide contained in the first layer. Everett et al. fails to disclose the amount of chromium carbide contained in the sole layer formed on the substrate. Quets et al. fails to disclose even the presence of chromium carbide in the duplex coating structure described therein, much less a specific amount of chromium carbide. Thus, there is no teaching contained in the combination of Everett et al. and Quets et al. which would describe or suggest the above-mentioned relative chromium carbide amounts.

The remaining claims depend from claim 6. Thus, these claims are also distinguishable over the apply prior art for lease the same reasons noted above.

Reconsideration and withdrawal of the grounds for rejection is respectfully requested.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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